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Circular No. 29 - The Control of Rodent Pests: Directions for Killing Ground Squirrels, Pocket Gophers, Rabbits, and Field Mice

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EXPERIMENT STATION

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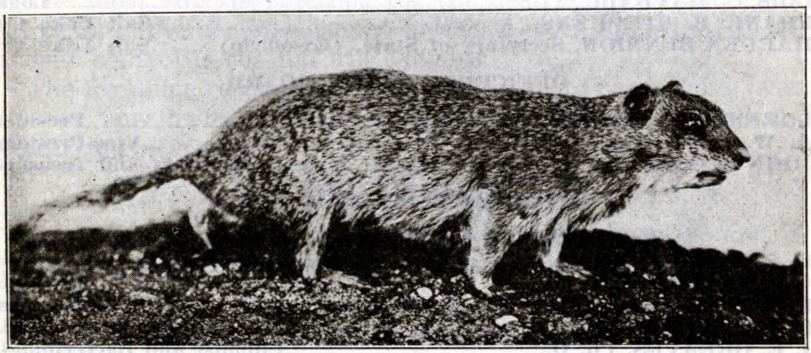

Ground Squirrel

The Control of Rodent Pests

DIRECTIONS FOR KILLING

GROUND SQUIRRELS, POCKET GOPHERS, RABBITS, AND FIELD MICE

By

CHARLES J. SORENSON

Logan, Utah, March, 1918

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THE CONTROL OF RODENT PESTS

DIRECTIONS FOR KILLING GROUND SQUIRRELS, POCKET GOPHERS, RABBITS AND FIELD MICE

By
CHARLES J. SORENSON

Rodent pests cause heavy damage to the crops of Utah. The four most destructive of these pests are ground squirrels, pocket gophers, rabbits, and field mice.

The most effective method for the destruction of these animal pests is the use of poisoned baits. A very important factor in their control is the natural enemies.

The formulae recommended in the following pages have been, and are now being, used with excellent success in this and neighboring states.

GROUND SQUIRRELS

Ground squirrels may be killed with poisoned grains and by fumigating their burrows with carbon bisulphide.

POISONING WITH STRYCHNINE—COATED GRAINS

Formula Number 1: Bureau Biological Survey

This is the latest government formula for preparing poisoned oats to kill ground squirrels.

Oats (clean grain)	12 quarts
Strychnine (powdered alkaloid)	1 ounce
Bicarbonate of soda (baking soda)	1 ounce
Saccharine	1 teaspoonful
Flour	3 tablespoonfuls

Directions for mixing: Mix together dry, the strychnine, baking soda, saccharine, and flour. Add a little cold water and stir to a smooth, creamy paste. Pour this over the oats and mix thoroughly to distribute the poison evenly over each kernel. Spread out and dry the grain before using. For mixing small quantities a common galvanized iron tub is convenient. For large quantities, a smooth, tight wagon-box may be used and the mixing done with a shovel.

Grain poisoned in this manner may be used during any season of the year, but the best time to use it is in early spring when the squirrels first appear after hibernating over winter.

The next two formulae, recommended by the Colorado State Entomologists's Office, have been found very destructive to

ground squirrels, prairie-dogs, kangaroo-rats, and similar rodents.

Formula Number 15 is used most effectively in early spring, whereas Formula Number 28 may be used successfully at any season of the year, even though the green food is abundant.

Colorado Formula Number 15

Barley, wheat or oats (clean grain)	12 quarts
Strychnine (powdered alkaloid)	1 ounce
Saccharine	1 teaspoonful
Flour	¾ pint
Fine salt	½ pint
Water	2 pints

Directions for mixing: Dissolve the saccharine and strychnine in the amount of water called for; add the flour and salt; mix thoroughly with an egg-beater; put over a fire and bring to a boil, or heat until the flour begins to thicken; stir constantly while heating. Pour the poisoned solution over the grain, mix thoroughly, and then spread out to dry.

Colorado Formula Number 28

PART I

Oats (clean grain)	14 quarts
Strychnine (powdered alkaloid)	1 ounce
Starch	½ pint
Water	1 quart

PART II

Knox Gelatin, No. 1 plain	(1 box or 2 envelopes)
Bicarbonate of soda (baking powder)	1 ounce
Dark brown sugar	½ pound
Water	1 quart

Directions for mixing: First, prepare Part I as follows: Dissolve the strychnine in the quart of water, add the starch and stir until it is all dissolved; put over a fire and heat until the starch begins to thicken, stirring constantly.

Pour this poisoned solution over the grain and mix thoroughly until each grain is evenly coated; then let stand for five or six hours.

Re-treat the poisoned grain with Part II as follows: Dissolve the gelatin in one pint of cold water; add one pint of boiling water; add soda and stir until it stops foaming, then add the sugar, and when it is dissolved, pour the mixture over the poisoned grain and again mix thoroughly; spread it out to dry.

AMOUNT TO USE AND WHERE TO PLACE THE BAITS

Each quart of any of these poisoned grains is sufficient for 40 to 60 baits. The baits should be scattered (1 teaspoonful to a place) along the squirrel trails, or preferably on clean, hard surfaces near, but not inside of, the holes. When put out in this manner livestock is not endangered.

TIME OF DAY TO PUT OUT THE BAITS

The best time of day for putting out the baits is early in the morning, as soon after daylight as possible and before sunrise. The squirrels spend the night in their burrows and come out early in the morning to feed. If the bait is found at this time, when the animals are hungry, it will be eaten with greater relish and its action will be more rapid and effective than after taking a meal of the natural food. If the bait cannot be put out in the morning, it should then be scattered in the evening after the animals have gone into their burrows for the night.

NOTE: In buying strychnine be sure to get the commercial, powdered alkaloid. Strychnine in any other form is not effective in the above preparations.

An important point to remember, if the best success is expected, is to follow the directions exactly and make the measurements accurately.

CAUTION: All baits, all containers, and all utensils used in the preparation of the poisons should be PLAINLY LABELED and kept out of reach of children, irresponsible persons, and livestock.

FUMIGATION

Ground squirrels may be destroyed by fumigating their burrows with carbon bisulphide.

WARNING: Carbon bisulphide is highly explosive and inflammable; therefore it should never be brought near a fire nor opened near anyone who is smoking. It evaporates very rapidly; hence it should be kept in tightly corked bottles or cans. Great care should be taken not to breathe the fumes of carbon bisulphide; a few breaths may cause unconsciousness.

Directions for use: Two-thirds of an ounce (1½ tablespoonfuls) of carbon bisulphide should be poured on a small piece of cotton waste, shoddy wool, corn-cob, dry horse manure, or other cheap absorbent material and placed as far down into the burrow as possible. The opening of the burrow should be closed immediately with a shovelful of earth or sod. All animals in the burrow will be asphyxiated. Every burrow showing evi-

dence of use should be treated and all holes closed with dirt.

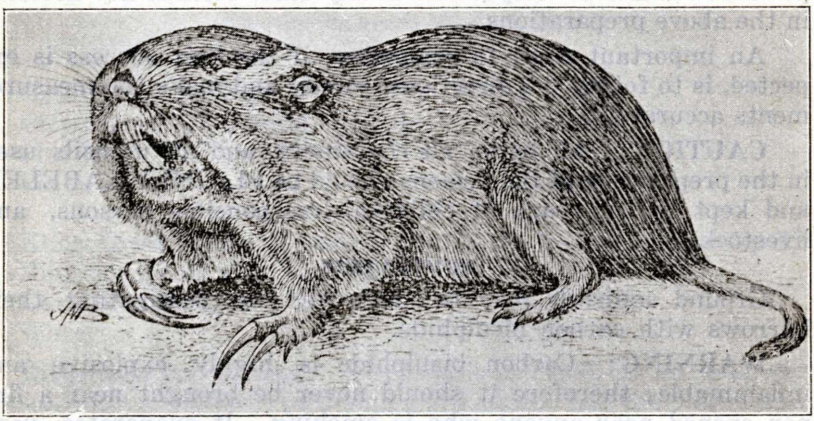
Because carbon bisulphide gas is heavier than air, it settles into the lowest parts of the burrow and will not go into any parts higher than the entrance of the burrow, unless pumped there with a special pump or exploded with proper precautions.

One gallon of the liquid is sufficient to treat 200 holes. This can be done by one man in 2 to 3 hours. It is used to better advantage after heavy rains or after irrigataions; for when the ground is dry and full of cracks, the gas escapes and is not confined to the burrow as it is when the ground is wet.

The cost of treatment with carbon bisulphide is greater than with poisoned grains.

POCKET GOPHERS

Pocket gophers are seldom seen. They live in underground tunnels from three to ten inches below the surface where they feed upon the roots of nearly all kinds of crops. The tunnels are extended as need of more food arises.



Pocket Gopher

Openings from the tunnels to the surface are made at intervals of a few feet, through which the loose earth, dug from the burrows, is pushed out in little heaps, varying from a few quarts to a bushel. The opening is then closed by packing it full of earth. As the tunnel is extended, a new opening is made farther along, and a new mound marks the line of progress. Gophers are solitary, more than one rarely if ever occupies the same burrow. Judging from the great number of mounds on a small area, however, it is very probable that they live in colonies. In

the course of a month, a dozen gophers in an alfalfa field will throw up several hundred mounds of earth. It is by these mounds that the pocket gopher is best known. In alfalfa fields these mounds seriously interfere with mowing. Close mowing is prevented and much damage is done to the mowing machine.

Two practical methods of killing pocket gophers are poisoning and trapping. Poisoning is the more effective and practical method for ridding large areas of these pests. The baits consist of poisoned sugar beets, sweet potatoes, parsnips, or carrots placed in the underground tunnels.

Formula Number 2: Bureau Biological Survey

Strychnine (powdered alkaloid)	⅛ oz.
Saccharine	1/80 oz.
Vegetables	4 quarts

Directions: The vegetables should be cut about 1 inch long and ½ inch square, washed and drained. The strychnine and saccharine should be ground together dry in a mortar or dish; then slowly sifted from a pepper box over the dampened baits, stirring the while to distribute the poison evenly.

Trapping is slow and requires careful work. Although any steel trap may be used successfully, much better results are had with the special traps made for these animals. The regular Macabee gopher trap and the Reconstructed Macabee gopher trap are examples of these special traps. Trapping is effective only on small areas where few gophers are present. The traps are baited and set in the main underground tunnels; two traps are set a few inches apart and face in opposite directions so as to catch the gopher if he comes from either direction. The hole that has been made into the tunnel should be closed after setting the traps.

The tunnels of pocket gophers may be located by means of a probe. This tool may be made from a shovel or pitchfork handle by fitting into one end a ⅜ inch iron rod, protruding about 12 inches, and bluntly pointed. A foot rest fitted on the handle, about 15 or 16 inches above the point, is very helpful. By probing this tool into the ground, near gopher workings, or a foot or two back of fresh mounds, the open tunnel can be felt as the iron point breaks into it. The hole may be enlarged by pressing the probe against its sides or by using the opposite, blunt end of the instrument. One or two baits are dropped into the main tunnel, not in the short laterals which lead to the mounds, and the probe hole is closed.

A man soon becomes expert in locating the runs, and can treat 300 to 500 gopher workings in a day. Baits need to be placed at only two points in each separate system of 10 to 30 mounds, which is usually the home of a single gopher. This method has met with success wherever used.

CAUTION: Observe the same precautions with respect to poison containers and utensils as recommended in mixing the baits for ground squirrels.

JACK RABBITS

When rabbits become a pest to crops and it is impracticable to use their flesh for food, they may be killed with poisoned baits.

POISONED ALFALFA

Formula Number 3: Bureau Biological Survey

Strychnine (sulphate)	1 ounce
Hot water	2 gallons
Alfalfa (leaves or chopped)	10 pounds

Directions for mixing and putting out the baits: Dissolve the strychnine in the hot water and sprinkle over the alfalfa. Mix thoroughly until all the moisture is absorbed.

The poisoned alfalfa should be distributed at night in small handfuls, and in lines a few feet apart, across portions of fields where observations show the rabbits to be feeding. Stock should be excluded from the fields. After snow falls poisoned alfalfa should be distributed about the stackyards or in previously baited enclosures from which stock are excluded. These enclosures should be baited with a small quantity of clean alfalfa hay a few nights previous to poisoning so as to get the rabbits accustomed to feeding in them.

This bait is used in winter, preferably after the snow covers the ground, and when the natural food is scarce.

POISONED OATS

Formula Number 4: Bureau Biological Survey

This formula is specially recommended by the Biological Survey for use in Utah.

Strychnine (sulphate)	1 ounce
Gloss starch	1 tablespoonful
Baking soda	1 ounce
Heavy corn syrup	1 tablespoonful
Table salt	1 teacupful
Water	1 pint
Oats (plump and clean)	12 quarts

Directions for mixing: Dissolve the strychnine in ¾ pint of water and heat to the boiling point. Mix the starch in ⅛ pint of cold water, add to the strychnine solution, stir, and boil until a clear paste is formed. Remove from the fire, add the soda (previously dissolved in ⅛ pint of water) and the syrup, then stir to a smooth, creamy mass. Stir in the salt. Pour over the oats and mix thoroughly until the grain is evenly coated. Allow to stand about two hours before distributing to allow the poison to penetrate the grain.

Distribute the poisoned oats at night in small quantities of about a tablespoonful in a place, and in lines a few feet apart, where it is known that the rabbits are feeding. Each quart of grain is sufficient for 25 to 30 baits.

In fields or on the ranges where stock are present, the poisoned baits should be placed in small enclosures from which the stock are excluded. Bait these enclosures with a small quantity of clean oats a few nights before putting out the poison.

This bait is effective at all times of the year, but the best results are obtained during the winter months.

CAUTION: Exercise unusual care in keeping the poison, the baits, and the utensils used in mixing the baits away from children and animals.

FIELD MICE

Field mice do not hibernate during the winter as do some of the other rodents, but are active throughout the year. They feed night and day.

In the winter these animals may be economically and effectively killed with poisoned alfalfa, prepared according to Formula Number 5.

Formula Number 5: Bureau Biological Survey

Strychnine (sulphate)	1 ounce
Hot water	2 gallons
Alfalfa (chopped or leaves)	30 pounds

Directions for mixing: Dissolve the strychnine in the hot water and sprinkle it over the chopped alfalfa hay or alfalfa leaves, previously moistened with water. Mix and thoroughly stir until the liquid is evenly absorbed by the alfalfa.

Put the bait out in small quantities, about a tablespoonful to a place, along the mouse runs and at the entrances of their burrows.

Poisoned grains may be used effectively at any time of the year. Prepare these baits in accordance with Formula Number 6.

Formula Number 6: Bureau Biological Survey

Strychnine (sulphate)	1 ounce
Boiling water	2 quarts
Laundry starch	2 tablespoonfuls
Cold water	½ pint
Oats (clean grain)	1 bushel

Directions for mixing: Dissolve the strychnine in the boiling water. Dissolve the starch in the cold water. Add the starch to the strychnine solution and boil a few minutes until the starch is clear. Pour the solution over the oats in a metal tub and stir thoroughly until each grain is evenly coated. Let the grain stand over night to absorb the poison.

The poisoned grain should be distributed along the runs and near the holes, not more than a teaspoonful in a place. Choose areas covered with weeds, brush, hay, straw, or rubbish on which to scatter the baits so as to avoid destroying birds.

It will be observed that the larger grains, such as oats, are recommended for all of the baits. The reason for this is that birds do not eat these grains as readily as the smaller ones.

CAUTION: Keep all poisons labeled and out of reach of children and animals.

PROTECT THE NATURAL ENEMIES OF RODENTS

One of the chief causes which have favored the rapid increase of ground squirrels, mice, and other rodent pests has been the driving away from the fields, and the killing off, by man, of the natural enemies of these animals.

Some of the smaller carnivorous animals such as badgers, skunks and minks, most of the hawks and owls, and nearly all of the snakes are the farmer's best allies in the control of rodents. In spite of this fact, we are unwisely and in many cases, ignorantly, allowing many of these beneficial animals to be killed off instead of protecting them. Before killing any animal, a person should make sure that it is his foe and not his friend.

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